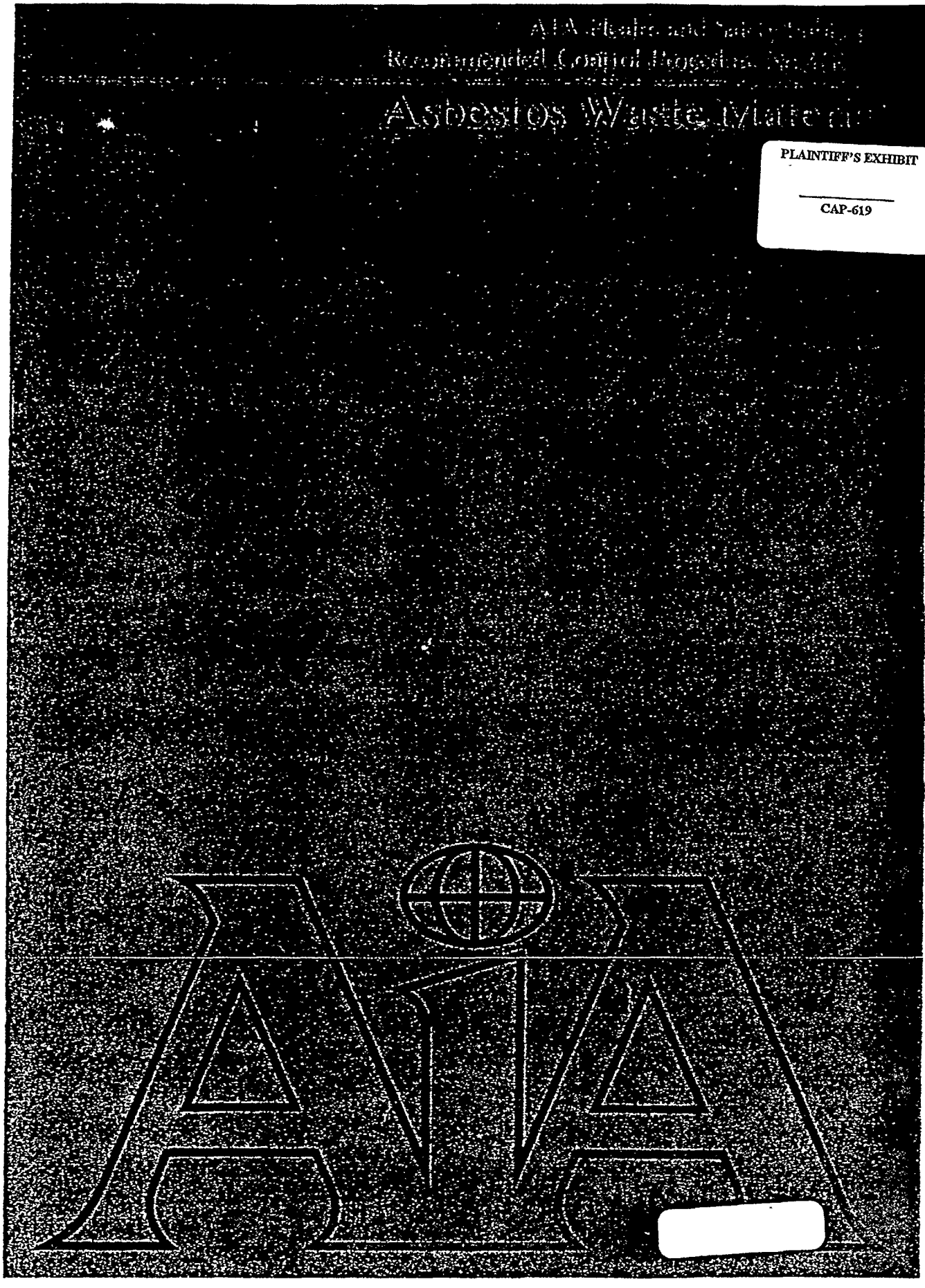
AIA Health and Safety
Recommended Contract Provisions No. 6

Asbestos Waste Management

PLAINTIFF'S EXHIBIT

CAP-619



INTRODUCTION

The prime object of this Association is to encourage and facilitate the endeavours of its members to eliminate risks to health, occupational and environmental, arising from the use of asbestos.

Many countries have official regulations and guide lines which producers, manufacturers and consumers are required to observe in order to prevent such risks occurring, and progressively the standards stipulated are being achieved. In the course of applying these requirements much practical experience has been acquired, and the interchange of such knowledge and the maximising of control techniques is seen as the principle means by which our members can attain our prime objective.

There are still areas where official guidance has not been provided, and others where the problems of applying statutory requirements are new and may appear formidable. The Asbestos International Association believes that it has an opportunity and a responsibility to provide what help it can to those concerned with this problem from the wide experience of its members, and has decided therefore to produce a series of advisory publications for this purpose.

We wish to remind readers of two important points. First, in considering any recommendations in the AIA publications these should be related to the specific legal requirements in the country concerned. It is clearly not possible in such publications to relate the recommendations in every respect to the specific detailed regulations in each state. Nevertheless, the greater part of existing laws on the subject calls for similar forms of control and where no official regulation exists we advise that action should be based on the recommendation of the ILO meeting of experts on the safe use of asbestos, December 1973.
Secondly, the development of techniques of control is a continuous process, and we hope that the efforts we are undertaking will help to accelerate the process. Techniques which are recommended have reached their present stage as a result of interchange of ideas and practical experience between international experts in the asbestos industry, plant manufacturers, government agencies and many others. It will certainly be necessary regularly to up-date and amend these publications in the light of new ideas and criticisms. All such will be welcomed and will be given full consideration during revision stages.

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11 August 1979

AIA Health and Safety Publication
Recommended Control Procedure No.3 (RCP3)

Asbestos Waste Materials

Asbestos Waste Materials

CONTENTS

1. Asbestos waste

1.1 This document gives the recommended procedures for handling and disposing of asbestos waste. However, one should not overlook the most effective and economic method of control, that is, the *avoidance* of waste. Some types of asbestos waste can be re-cycled or can provide raw material for a different product. The creation of waste may be minimised by improved production techniques.

1.2 There is general agreement that the occupational hazards associated with asbestos arise through the excessive inhalation of respirable asbestos fibres. There is no evidence at the present time of any harmful effects due to the ingestion (swallowing) of asbestos from drinking water. Therefore, the methods of waste disposal recommended concentrate on the need to avoid the escape into the atmosphere of unacceptable levels of respirable asbestos dust from the waste material:

1.2.1 During collection.

1.2.2 During transit to the disposal site.

1.2.3 When finally deposited.

2. Types of asbestos waste

2.1 It is important to consider the different types of asbestos waste which may be encountered. They will generally fall into one or other of the following categories:

2.1.1 Fine dust — from dust control equipment, filter units, vacuum cleaners.

2.1.2 Loose fibre, swarf, floor sweepings, etc.

2.1.3 Wet waste in the form of sludge, slurry, lumps, and/or pellets containing asbestos.

2.1.4 Waste material from the fixing or removal of thermal insulation or sprayed insulation containing asbestos.

2.1.5 Offcuts, broken pieces and rejects from friable materials.

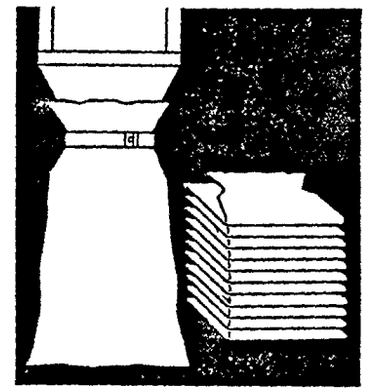
2.1.6 Offcuts, broken pieces and rejects from high-density products, where the asbestos is firmly bonded with other materials, e.g. asbestos cement, moulded plastics, etc.

2.1.7 Empty sacks or bags which have contained loose asbestos fibres or mixtures containing asbestos fibres.

3. Collection of waste

3.1 Fine dust. Fine dust may be produced from material conveyors, mixing equipment or by such processes as sawing, sanding or machining.

3.1.1 The dust is collected by installed extraction systems. The air is filtered and the dust collected in hoppers which are normally fitted with bagging-off outlets. These outlets should be designed to make bag changing easy and dust leakage minimal.



3.1.2 Polyethylene bags of adequate strength for good handling are recommended so that the dust level can be seen and the bag changed before it is over-filled (200 gauge polyethylene, double sealed at bottom, has been found satisfactory).

3.1.3 Other types of impermeable bags such as multi-wall paper sacks may be acceptable, if there is no risk of deterioration (e.g. by wetting) before disposal. When filled, the bags should be sealed so as to prevent the escape of dust during subsequent handling.

3.1.4 Polyethylene bags should be twisted tightly, folded over and the neck secured in the folded position by wire tie, adhesive tape or other equally effective method. Paper bags should be folded over twice and stapled along the folded edge.

3.1.5 Approved respirators and suitable protective clothing must be worn when changing bags on a dust collector. In some cases, dust is removed by wet collectors. The resultant slurry is dealt with in 4.1.3 below.

3.2 Loose fibre, swarf and floor sweepings

3.2.1 Loose fibre is often handled by fixed extraction systems and filter units in the same way as fine dust. It can also accumulate in fibre-testing laboratories. Wherever possible, such material should be consumed in the production process.

3.2.2 Swarf accumulates around and under machines and on floors. Cleaning around machines and the collection of swarf should be carried out by the use of vacuum cleaners suitable for asbestos or by other dustless methods. Where vacuum cleaners are used, they should be fitted with disposable paper or plastic bags rather than fabric dust-bags which would require emptying.

3.2.3 Loose material collected by other means should be placed in impermeable bags and sealed, as in 3.1.2 to 3.1.4 above.

3.2.4 Information and recommendations concerning suitable dust-collecting machines can be provided upon request.

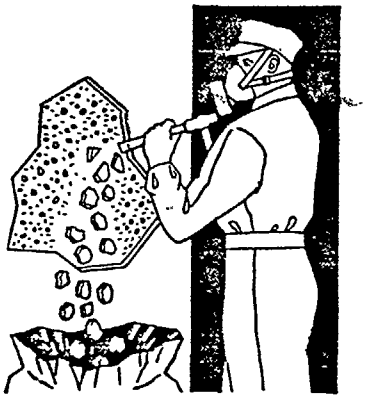
3.3 Wet waste in the form of sludge or slurry containing asbestos

3.3.1 Waste asbestos in the form of sludge or slurries likely to arise from industrial processes (e.g. board making) should only be transported in purpose-built vehicles. These should be such as to prevent spillage of liquid which may subsequently dry out and from which unacceptable quantities of asbestos dust might be released (see 4.1.3 and 4.2.5 below).

3.4 Waste materials from fixing or removal of (1) thermal insulation or (2) sprayed insulation containing asbestos

3.4.1 Waste material from fixing or stripping operations can be conveniently collected on polyethylene sheeting which is subsequently folded to form a sealed container.

3.4.2 Where such material has been allowed to fall on floors, it should be thoroughly damped before sweeping up and the damped material should be placed in impermeable bags or other disposable receptacles and sealed, as in 3.1.2 to 3.1.4 above.



3.4.3 In some cases, removal may be effected by the use of large quantities of water so that a slurry is created. In this case the wet material may be more conveniently collected and removed in special containers (see 4.1.3 below).

3.5 Offcuts, broken pieces and rejects of friable materials

3.5.1 By 'friable' we mean material, usually of low density, which is fragile and breaks easily into small pieces.

3.5.2 The variety of shapes and sizes of offcuts, rejects, etc., in different factories calls for individual collection and disposal methods. Where possible, provision should be made in the design of machines for the automatic removal of offcuts, etc., and their collection in disposable receptacles which can be removed and sealed as described in 3.1.2 to 3.1.4 above. Wherever practicable, effort should be made to re-process such material into the end product.

3.5.3 When automatic removal and collection is impracticable, suitable receptacles must be provided. Attention should be given to the following requirements:

(a) Receptacles must be capable of being closed so as to prevent the escape of dust.
(b) If, during use, dust arises from the mouth of the receptacle, a dust extraction hood should be provided to prevent the uncontrolled escape of dust into the work-place.
(c) The supply of receptacles should be sufficient to prevent overfilling and to be conveniently available to the work-place.
(d) Regular removal of full receptacles and replacement by empty ones should be arranged.

3.5.4 Offcuts and rejects may sometimes need to be broken down to a more convenient size for collection. Wherever possible this should be done mechanically with adequately ventilated equipment.

3.5.5 When this is not possible, methods should be devised to reduce the creation of dust as far as possible (for example, by wetting) and the work should be performed in an area from which asbestos dust cannot escape to other working-areas. Employees engaged in this work must be issued with approved respirators and protective clothing.

3.6 Offcuts, broken pieces and rejects from high-density products such as asbestos cement, moulded plastic materials, etc.

3.6.1 Waste material of this kind does not normally give rise to the emission of dangerous dust and in such cases need not be placed in special receptacles. Where such material is kept separate from other asbestos waste, it may be stored in a suitable area to await transport and disposal as detailed in 4 below.

3.7 Sacks or bags which have contained asbestos

3.7.1 Sacks or bags which have contained loose asbestos fibres, or mixtures including loose asbestos fibres, should be deposited in a suitable receptacle (see 3.5.3 above) immediately after being emptied.

3.7.2 For disposal (as in 4 below) the sacks or bags should be bundled, under a dust extraction hood, and then sealed in an impermeable bag as in 3.1.2 to 3.1.4 above.

3.7.3 A further method of plastic bag disposal is to melt it. By melting the empty plastic bags and wrappers, the asbestos residue becomes embedded in the melted plastic. As a result of the asbestos being 'locked in', it should be possible to dispose of this material in any normal disposal site. Specific low-volume melting equipment, which can be employed at individual bag-opening stations, is in development.

3.7.4 In no case should these bags be re-used for packing or for any purpose other than that described at 3.7.5 below.

3.7.5 Bags can be re-used for re-cycling or incorporation in some end products (see AIA RCP4) provided that the re-using plant is aware of the need for controls when handling asbestos.

3.8 Labelling

It is recommended that all waste materials in categories 3.1 to 3.7 above be identified by a label or by imprint on the disposal receptacle as "Asbestos Waste — for Disposal as Instructed". Where the waste is of a dusty nature, the additional words "Do not inhale Dust" is recommended.

3.9 Isolation of asbestos waste

Care should be taken not to mix asbestos waste with other waste material for which there are no special disposal requirements (e.g. common factory refuse). Ensure that bags containing asbestos are not exposed to damage from trucks, etc., likely to cause spillage. Where possible, a separate store area is recommended for asbestos waste awaiting disposal.

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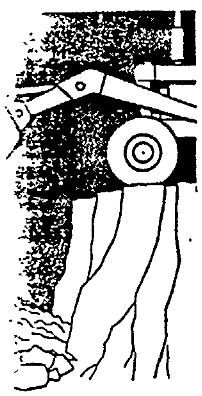

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4.3 Personal protection and hygiene

4.3.1 Any persons who in the course of their work of collecting, transporting or disposal may be exposed to a higher level than the accepted TLV of respirable asbestos dust, must be provided with suitable protection.

4.3.2 Vehicles and re-usable receptacles and covers must be cleaned after use so that they are free of residual asbestos dust.

5. Waste disposal instructions

5.1 Where a firm itself disposes of its asbestos waste, written instructions based upon these recommendations should be issued to the staff concerned.

5.2 If a waste disposal contractor is employed, the relevant terms of these recommendations should be incorporated in the contract.

5.3 The contract should state clearly that the waste disposal contractor is responsible for observing the recommended precautions at the disposal site.

5.4 Firms should make periodic checks to ensure that the contractor is obeying instructions.

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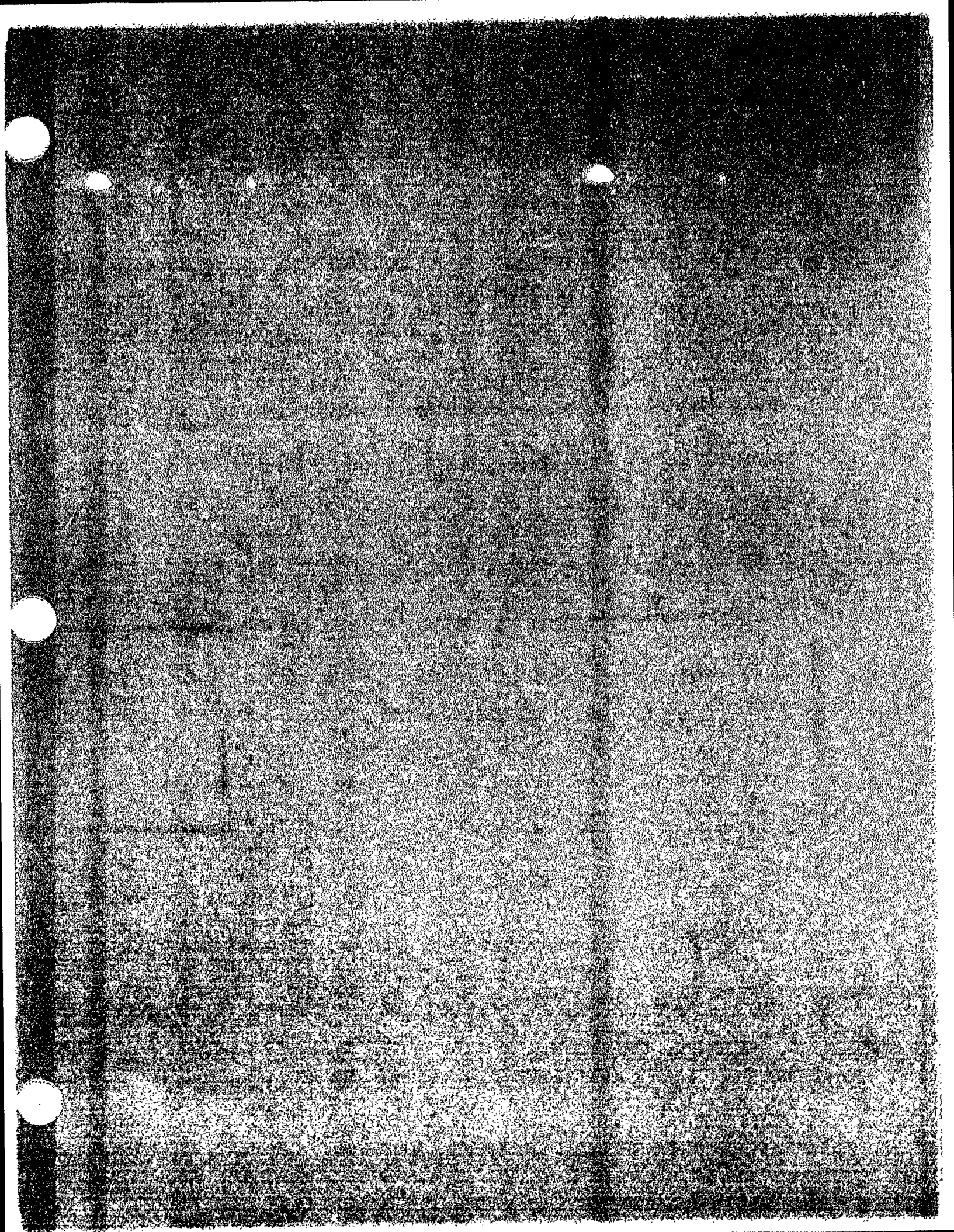

Bulletin

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Pg 1-3

Proposed regulatory action unjustified

In a brief submitted to the Ontario Ministry of Labour, the Association des mines d'amiante du Québec contends that there is neither a scientific basis nor any medical, social or economic justification for a regulation proposed by the Ministry that would lower the permissible average exposure to asbestos in the work environment.

Basing itself on the 1978 Occupational Health and Safety Act, the Ministry is proposing that the permissible level of airborne dust emissions in the asbestos mining and manufacturing industry be reduced to one fibre per cubic centimeter.

Unwarranted haste

The Association is unable to find any justification for the suggested standard which seems to have been largely precipitated by recent media coverage that has been more sensationalist than informative. Moreover, the proposal comes at a time when a Royal Commission of inquiry into all aspects of the asbestos health issue has barely begun its work in Toronto.

This contradiction is underlined in the brief which has been documented from a scientific and medical, as well as technological, economic and social point of view.

Pointless reduction

The Association supports its position with numerous scientific and medical research studies, including the results of the latest and most important epidemiological study on the effects of asbestos exposure.

The AMAQ brief points out that at an exposure level of roughly 20 fibres per cc (a level which has not been found for many years), an increase in risk is practically undetectable. At 2 fibres per cc — the current standard — it is scientifically impossible to prove any increased risk. Tightening the standard any further would thus be utterly pointless and would provide no additional guarantees with respect to workers' health.

In view of the fact that the present standard should be considered safe, as acknowledged by both the Canadian and Québec governments, and since a reduction of the norm to 1 fibre per cc would not increase safety, the only effect likely to arise from enforcing such a needlessly severe standard would be to hamper the asbestos industry's ability to function effectively.

Technologically unfeasible

The AMAQ brief also establishes that existing technology does not permit a constant average exposure level of 1 fibre per cc to be maintained in the mining sector.

Based on the results of dust monitoring and control measures and statistical data compiled by the Association and its member companies, the brief shows that even with the utmost effort and using all means available, including the very latest technology, it proved impossible, even the cleanest and most modern mine facilities operating under optimum conditions, to reduce average airborne dust concentrations below the level which is now obtainable on a continuous basis and which varies between 1.5 and 2 fibres per cc.

Planned standard unjust

However, the fact that it is neither feasible nor possible at present to reduce the norm should not be a cause for concern. As the report emphasizes, it has been medically proven that, aside from those exposed to the higher dust levels of more than twenty years ago, the health of asbestos workers is comparable to that of the general population.

It is hoped that the Association's brief, which also puts in perspective the importance of the asbestos industry's socio-economic contribution to Canada, will convince Ontario Ministry of Labour authorities that the proposed standard is indeed unfair, since it is scientifically and medically unjustified, technologically unfeasible, and potentially very damaging in socio-economic terms.

Information centre projects fun

When the Institut de Recherche et de Développement de l'Amiante (IRDA) was founded, it was decided that not all research work or projects would necessarily be done within the IRDA itself, in order to take advantage of all available resources that could help the institute to fulfill its objectives.

Within the framework of a "Research Support Program", it was anticipated that certain projects would be entrusted to the groups best able to produce good results, such as public, parapublic or private research centres, or organizations in the academic or industrial sectors.

In keeping with this policy, IRDA's Board of Directors has recently acted on the recommendations of the Scientific Committee to authorize $224 476 in grants aimed at financing an asbestos documentation centre and three research projects.

Documentation centre

The documentation centre, which received a $116 000 IRDA grant for the 1981 fiscal year, was founded in 1977 as part of the Université de Sherbrooke asbestos research program. It is already considered the most important of its kind in the world. By providing this funding, IRDA is assuming financial responsibilities held until now by the university, the Ministère de l'Éducation and the Bureau de l'amiante.

Furthermore, in full accordance with one of IRDA's fundamental objectives, which is to provide a more accurate definition of the characteristics of asbestos-based products in terms of safety, the Board of Directors gave the green light to a research project submitted by professors D. Nadeau, Ph.D.

At the Université de Sherbrooke's asbestos documentation centre, electronics facilitate reference work.

and G. Poirier, Ph.D. from the Université de Sherbrooke, Science Faculty.

Scientific research

In their project, the two Québec researchers hope to develop an "in vitro" test (conducted in an artificial medium, as opposed to "in vivo" tests using guinea pigs) which would permit rapid evaluation of the possible biological changes in pulmonary cells resulting from contact with fibrous particles.

IRDA's two grants, totaling about $62 000, will cover the first year of research. The study is especially important because it should allow rapid differentiation between the biological effects of pure chrysotile fibres, and those of chrysotile fibres chemically altered as a result of their incorporation in finished products. Since this research concerns fibrous particles in general, it will also provide invaluable information on the biological effects of various materials proposed as asbestos substitutes. This project is a follow-up on recent studies which reveal that when pure chrysotile fibres are incorporated in mixtures, chemical changes occur in the fibres that can modify their biological effects.

Applied research

In accordance with another IRDA objective — to improve existing products and develop new asbestos applications — a $52 650 grant was awarded to R. Gauvin, an engineer and professor at the Université de Montréal's École polytechnique, to evaluate the applications of asbestos-plastic mixtures.

As the use of plastics for machine parts has been increasing considerably, Professor Gauvin's research will concentrate on the possible development of asbestos-plastic mixtures to

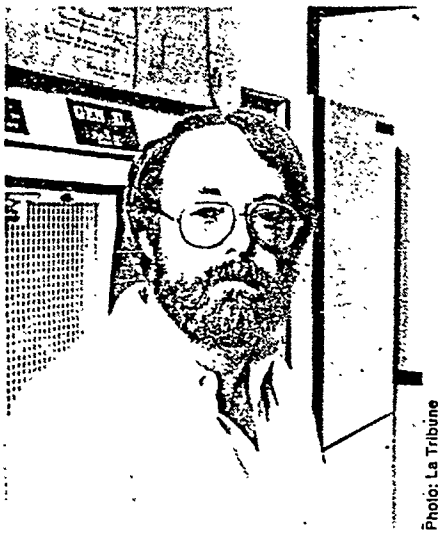


Photo: La Tribune

Professor D. Nadeau in his lab at the Université de Sherbrooke.

and three research
ded by IRDA

be used in manufacturing gears for the automobile, pulp and paper, textile, printing, and other industries.

To date, asbestos has been used essentially as a filling agent in asbestos-plastic mixtures. The innovative aspect of Professor Gauvin's project is that he will be determining to what extent asbestos fibre contributes qualities of friction and mechanical resistance to asbestos-plastic mixtures.

To study the performance of new mixtures, Professor Gauvin will be using a test bed he personnally perfected.

In keeping with the constant goal of expanding the many ways in which asbestos is used, a $23 000 grant was awarded to Professor Kinh Ha, an engineer at Concordia University's Centre for Building Studies, to conduct design studies on asbestos-cement roofing attachments.

Asbestos-cement panels currently serve as roofing but do not contribute to a building's structural strength. Professor Kinh Ha will attempt to find a solution to this deficiency by designing attachments that would allow asbestos-cement not only to be used as roofing cover but also to serve a structural function. This research project, slated for completion in eight months, would have particular importance for buildings in regions susceptible to earth tremors, where roofing resistance must conform to more stringent specifications.

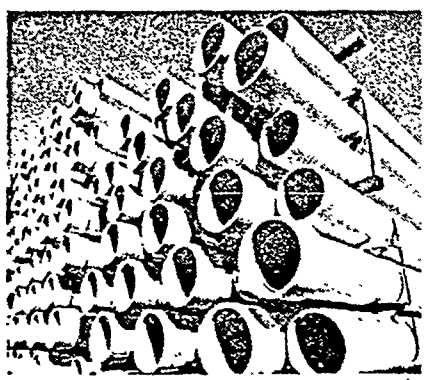
R. Gauvin, engineer and professor at the Université de Montréal's École polytechnique.

Study finds asbestos-cement pipes safer

The U.S. Environmental Protection Agency has published the results of a study concluding that asbestos-cement pipes used in aqueduct systems are less hazardous to health than vinyl polychloride or plastic pipes.

This study was conducted last summer at the request of the municipality of Lakeland, Florida, which wanted to know the risk to health involved in using various materials before starting work on expanding is aqueduct system.

According to the EPA, asbestos-cement pipes present the least risk when neutral water (low in acidity) is involved. The risk increases with pipes made of vinyl polychloride, vinyl, epoxy and plastic, in that order, with tar-lined pipes carrying the most risk.



Asbestos-cement pipes offer several advantages for the construction of aqueduct systems.

EPA experts arrived at this conclusion after analyzing various water samples taken from Lakeland's existing aqueduct system, which uses asbestos-cement pipes.

The agency's sole reservation concerns the quality of the water flowing through the asbestos-cement pipes. Researchers noted that if the water is too high in acid content, it risks damaging the pipes.

It is easy to get around this problem, however, in that municipalities only have to control the acidity of their water.

Rolling stock in the asbestos mines, from the wheelbarrow to the 200 ton truck

From the very beginning, the asbestos mining industry has been dependent on the technological means at its disposal. A century ago, the amount of ore extracted was largely determined by the number of picks, sledge hammers, borers, cobbing hammers, wheelbarrows, sleds and the occasional dump cart that could be put into use. But the most important factor was the number of men used, since "elbow grease" was that era's main energy source. Their labour compensated for the missing technology, which only developed as the industry's new needs made themselves felt.

Steam power

Due to the rudimentary equipment available in those days, earth and waste material could not be transported very far. They were dumped near the mine, preventing exploration of new sites and requiring deeper excavation to reach the ore. Indeed, the first boom derricks were used for this latter purpose. Initially, the boom derricks were powered by horses, then later, around 1890, by wood-fired steam boilers which also operated the borers.

Around the beginning of this century, an important milestone was reached. The introduction of return cableway derricks henceforth made it possible to transport wooden skips containing up to two tons of ore.

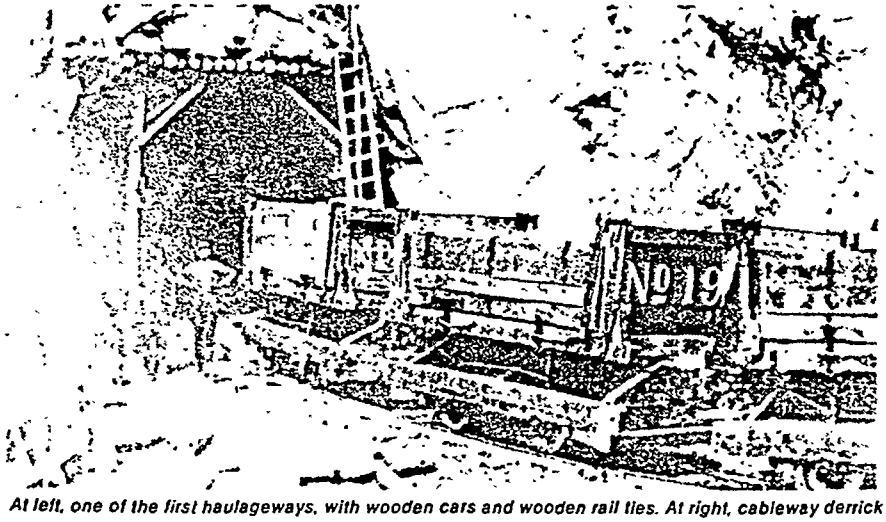
However, as mining excavation grew in size, transportation by cableway derrick became less efficient and haulageways had to be added to enable cars handled by electric hoists to circulate. Later, cable cars were replaced by mobile steam cranes installed in the pit itself.

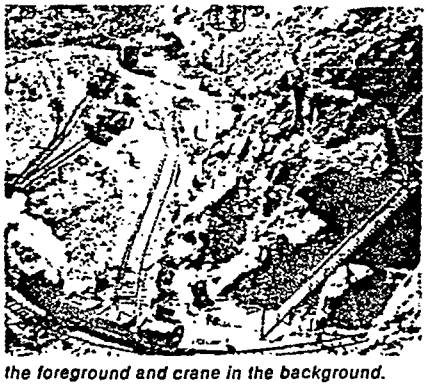
Soon, the development of a new technique was to change mining methods. With the introduction of spiral benches, underground haulage tracks carried the ore cars from the pit floor to the crusher through 20% graded galleries. The amount of track increased rapidly, car capacity rose from 4 to 10 tons, and powerful locomotives made their appearance in the mine.

War technology

On the eve of World War II, more mobile equipment replaced the rail haulage system. Companies were quick to recognize the advantages that could be derived from the use of equipment that was more adaptable, but no less tough and resistant. Shortly before 1940, bulldozers and tractors were introduced which not only fed the ore chutes but also towed the mine's first trucks, which had diesel engines and rolled on wheels and caterpillar treads, features borrowed from both the tank and passenger car.

Until as recently as 1972, truck haulage was complemented in some mines with a system of cableway derricks (skips moving on rail from the mine pit to the surface powered by electrical cables). Until 1945, industrial production and technical research were mobilized for the war effort, and equipment was scarce behind the lines. On the other hand, the technology developed during the war enabled the mines to benefit from new equipment which was hitherto unequalled in capacity, toughness and





At left, one of the first haulageways, with wooden cars and wooden rail ties. At right, cableway derrick in the foreground and crane in the background.

adaptability, and could be considered the basis for the rolling stock on which today's asbestos mining operations depend.

An impressive fleet

Since the 1950's, the number of vehicles used in asbestos mining has steadily increased and their power, toughness and capacity have been continually upgraded in response to the specific needs of mining operations. Thus, the mines both contribute to the advancement of industrial technology and benefit from the resulting progress. Today, in both underground and open pit mining, haulage of ore, overburden and tailings is no longer a challenge to mechanical ingenuity.

Mammoth vehicles weighing tens of tons and even 200 tons seem to move like toys in a mining playground so gigantic that electronic communication systems are needed to steer these metallic monsters safely and efficiently. In a small cabin overlooking the mine, dispatchers control and direct operations from a panel on which each shovel and truck is designated by a number. Trucks are dispatched to the shovels by radio and then on to their destination when loaded.

Economic impact

At present, the value of the asbestos mines' fleet totals some $130 million. Spare parts alone represent a market of more than $25 million a year.

In the mines of the AMAQ member-companies, 60 000 tons of asbestos ore are transported to the surface every 24 hours by 130 trucks ranging from 35 to 200 tons, 9 locomotives, 80 rail cars and nearly 400 men.

Due to the wide range of vehicles in the mining fleet, the industry's garage employees rank among the top specialists in the heavy equipment field. They check, adjust and repair engines as well as differentials and brake, fuel, hydraulic, pneumatic or electrical systems. To attain this degree of specialization, some mechanics have benefited from technical training programs provided by the manufacturers themselves. This sector of activities, which guarantees that extraction and transportation equipment is in good running order, ensures about 400 permanent jobs in the asbestos region.

Research

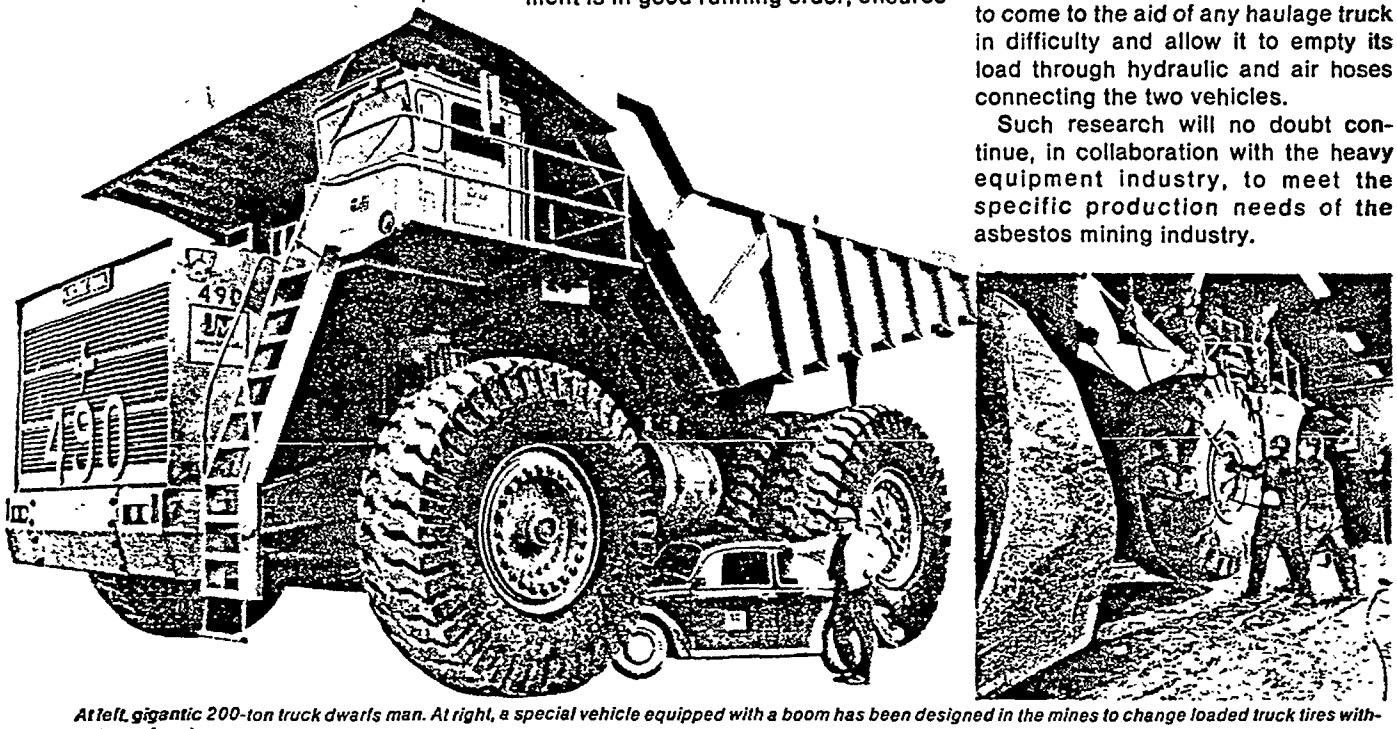
Mining companies are continuing their research in an attempt to improve equipment from the efficiency, worker safety and environmental protection standpoints and are making "in-house" improvements which will later be useful to manufacturers.

Thus, company research has tailored vehicles to the special needs of asbestos mining. For example, trucks hauling tailings have been equipped with a totally-enclosed dipper to prevent dust from escaping during loading, on the trip to the dump, and even during unloading, thanks to a built-in watering system.

As another environmental protection measure, water spreaders have been installed to reduce dust raised on the haulage routes, and a hydraulic tank truck was recently developed to sow the dump sites. To counteract winter conditions, graders and scoops have been equipped with sharp points which dig grooves in the frozen ground to prevent skidding on slippery haulage routes.

A tow truck has also been designed to come to the aid of any haulage truck in difficulty and allow it to empty its load through hydraulic and air hoses connecting the two vehicles.

Such research will no doubt continue, in collaboration with the heavy equipment industry, to meet the specific production needs of the asbestos mining industry.



At left, gigantic 200-ton truck dwarfs man. At right, a special vehicle equipped with a boom has been designed in the mines to change loaded truck tires without causing damage.

Bell's new test room now in operation

As part of its overall modernization program, Les Mines d'amiante Bell Ltée has just completed installation of a $225 000 test room which, according to its designer, Bob Smith, is the most modern facility of its kind. In a move towards greater centralization of operations, the room will serve as the communications and control centre for the entire processing plant.

The equipment installed in the new test room a month ago permits increased operating efficiency and better fibre quality control during bagging, the final phase. About every 45 minutes, samples of different grades of fibre taken before and during bagging are sent to the test room. Within minutes, control technicians are able to detect, report and correct any production defects such as imperfect or excessively long or short fibres.

Air quality

A special vacuum system then returns the analyzed fibre directly to the production circuit with minimal handling or dust emission. In keeping with the Company's policy to provide healthy working conditions, the test room is equipped with continuous temperature control and a ventilation system that filters, sterilizes and replenishes 5 000 cubic feet or air per minute.

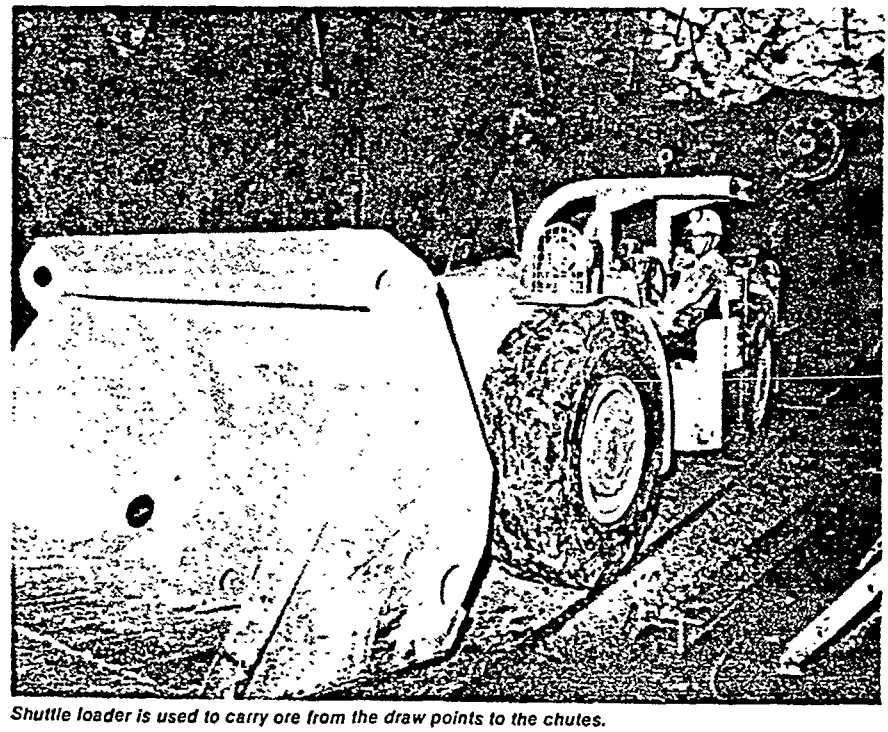
Hygiene was also a major consideration in constructing all counters, walls, equipment and furnishings — even the telephone — out of stainless steel, which has the advantage of being highly resistant while not retaining dust.

Central control

The central control system for the mill is now being installed in the room. A huge control panel with hundreds of luminous indicators has already been wired with some 4 700 connections linking it to the various work stations. The slightest defect, regardless of the cause, is immediately registered on the control panel and the production circuit is adjusted automatically, making work easier and a great deal safer.

From central control, a single person operating a few buttons can start up all of the mill's machines in sequence.

Expected to cost a total of about $1 million, the project should be entering its final phase within the next few months.



Shuttle loader is used to carry ore from the draw points to the chutes.

New mechanized method of ore extraction

Bell has recently implemented a new method of ore extraction designed by Company engineers to increase productivity while improving safety and comfort for workers in underground operations.

The current project brings Bell one step closer to the block caving system which the Company intends to implement in two years, primarily for ore extraction at subterranean levels below 1 000 feet.

The present phase of the operation involves mining a 160 x 500 ft orebody located west of the old drifts and containing two million tons of ore that represent a two-year asbestos reserve.

Environmental control

The orebody is crossed by two 500-foot parallel drifts, connected by a 160-foot drift and 35 draw points. Under the new system, mechanized diesel shuttle loaders with a capacity of 3 cubic yards per trip will carry ore from the draw points to the chutes. Formerly, each draw point was linked to a chute equipped with a grizzly. Dust emissions were thus multiplied, whereas today the shuttle loaders feed one larger chute from 20 draw points, allowing control over dust emissions at a single site. Dust control is facilitated further through regular use of water jets to dampen the ore.

The new mechanized extraction method offers immense advantages over the former system. Costs are equal but productivity is greater, and the more streamlined operation will make the miners' work easier, reduce the use of explosives, and lower dust levels.

Sculptures made of asbestos and water

Some sculptors like to work with hard materials such as stone, wood or marble, carving or chipping out the forms they want to reveal. Others turn welder or blacksmith to produce fascinating metallic creations. And still others prefer to shape and mould malleable materials like clay or wax.

Mrs Helga Lone Hodsman, a Canadian artisan who has dedicated herself to sculpture for the past eleven years, has opted for the latter method, with a difference. Her works are created from a unique asbestos-based material, undoubtedly because she has lived in Québec's asbestos region for more than thirty years. She does not work with asbestos-cement, which has been used by many renowned sculptors. Rather, she uses a paste made of short fibres (grade 7) and water, and is probably the only sculptor in the world to do so.

Mrs Hodsman with some of her sculptures.

An unusual art career

Mrs Hodsman did some drawing and painting in her youth, but only returned to art at the age of fifty, after raising eight children. This time around she was attracted to sculpture, and at the suggestion of some friends decided to experiment with asbestos fibres which her husband, a designer in the engineering department of Johns-Manville Canada, would bring home.

After six months of experimentation, Mrs Hodsman finally produced a paste mixture to her satisfaction. All she had to do was add water to the fibre until the mixture attained the desired consistency. Similar to clay, though less viscous and sticky, this material can be worked more easily and also has the advantage of not needing to be fired.

Mrs Hodsman's sculptures range between 6 and 24 inches in height. Larger or more complicated pieces are built around a frame. For small statuettes, she moulds the paste with her fingers, and for the finer details she uses various items from her manicure kit, having found these to be the most practical tools for her purpose. During the modelling stage, she has to make allowances for the fact that the sculptures have a tendency to shrink as they dry.

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Worldwide clientele

The finished sculptures are almost white, with a very pale gray tint. Mrs Hodsman usually leaves them in this natural colour, simply applying several coats of silicone to provide protection and a semi-mat finish. At the request of some clients, however, she does colour some of her sculptures.

A particularly elaborate piece: St. George and the dragon.

At the beginning of her career Mrs Hodsman displayed her works at various handicraft exhibitions, notably in the Eastern Townships region where Québec's asbestos mines are located. She has frequently participated in the important annual "Salon des Métiers d'Art du Québec" in Montréal, and there is also a permanent exhibition of her works in the Johns-Manville Manoir in Asbestos. Many visitors who have stayed at this company guest house have subsequently placed orders with Mrs Hodsman and as a result, her sculptures are now found in many parts of the world.

These days Mrs Hodsman is a little regretful that she has no time to work on sculptures of her own choice, since she is completely occupied with filling a growing number of orders. The subjects of her works are highly varied, inspired by her imagination or by pictures from books. Her sculptures include animals typical of Canadian fauna: bears, beavers, otters, seals, dogs and cats. History, mythology, folklore and folk tales are other frequent sources of inspiration. But in the final analysis, the subjects Mrs Hodsman like best of all are people, ordinary people engaged in their daily activities.

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